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| 10/587,741 | 07/27/2006 | Remo Meister | 5503-061852 | 3550 |
| 28289 7590 10/13/2011 THE WEBB LAW FIRM, P.C. ONE GATEWAY CENTER 420 FT. DUQUESNE BLVD, SUITE 1200 PITTSBURGH, PA 15222 | | | | |
| EXAMINER RAHIM, AZIM | | | | |
| ART UNIT 3784 | | PAPER NUMBER | | |
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patents@webblaw.com

Office Action Summary**Application No.**

10/587,741

Applicant(s)

MEISTER, REMO

Examiner

AZIM RAHIM

Art Unit

3784

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 July 2011.
- 2a) ☒ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on ____; the restriction requirement and election have been incorporated into this action.
- 4) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 5) ☒ Claim(s) 27-33 is/are pending in the application.
- 5a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 6) ☐ Claim(s) ____ is/are allowed.
- 7) ☒ Claim(s) 27-33 is/are rejected.
- 8) ☐ Claim(s) ____ is/are objected to.
- 9) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 10) ☐ The specification is objected to by the Examiner.
- 11) ☒ The drawing(s) filed on 04 May 2010 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 12) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-C1000)
Paper No(s)/Mail Date ____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date ____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: ____

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. Claims 27-29, 31 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka et al. (Tanaka, US 6,116,035) in view of Menin et al. (Menin, US 5,970,732).

Regarding claims 27 and 31, Tanaka discloses a refrigeration plant and operating method (referring to figure 44), which comprises in a refrigeration circuit (A) a compressor (11), a condenser (14), an injection valve (18) and an evaporator (the combination of cooling heat exchanger 15 and cold heat source heat exchanger 2), which is passed through on its secondary side (2) by a secondary medium (via refrigerant circuit B) to be cooled down, whereby a heat exchanger (the combination of heating heat exchanger 12 and hot heat source heat exchanger 1)

is provided between a feed line (the line at the bottom of cold heat source heat exchanger 2) for the secondary medium and a refrigerant line leading to said injection valve (the line at the top of cooling heat exchanger 15), such that said heat exchanger is positioned directly upstream of the entrance of said injection valve (illustrated in figure 44). However, Tanaka fails to disclose that the temperature of the refrigerant at the entrance of the injection valve is kept constant. The general concept of maintaining the temperature of a refrigerant upstream of an expansion valve falls within the realm of common knowledge as obvious mechanical expedient and is illustrated by Menin (referring to figure 1) which teaches a thermal expansion valve (7) that maintains a constant temperature superheating value of a refrigerant vapor after a liquid separator (3) (see column 6, lines 31-34), and one having ordinary skill in the art would have been motivated to include the use of maintaining the temperature of a refrigerant upstream of an injection valve constant in order to control the superheat of the evaporator, thus ensuring efficient operation of the refrigerant plant.

Regarding claims 28 and 32, Tanaka further discloses that the mass flow of the cooled-down secondary medium is at least partly passed through the heat exchanger in counter-flow with respect to the refrigerant flow (illustrated in figure 44) by means of a first valve (the valve disposed above cold heat source side heat exchanger 2).

8. Claims 29, 30 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka as modified by Menin as applied to claims 27 and 31 above, and further in view of Aflekt et al. (Aflekt, US 7,574,874).

Regarding claims 29, 30 and 33, Tanaka as modified by Menin teach all the limitations of the claimed invention, but fails to teach that the refrigerant leaving said evaporator is passed through an internal heat exchanger, and whereby a second valve is provided between said refrigerant line leading to said injection valve and said internal heat exchanger, such that a predetermined part of the refrigerant mass flow is passed through said internal heat exchanger, while the remaining mass flow is directly conducted to said injection valve, to additionally keep the temperature of the refrigerant at the entrance of the injection valve. Aflekt teaches (referring to figure 3) an internal heat exchanger (5) positioned downstream of an evaporator (4), and a three-way valve (6'') positioned between an injection valve (expansion valve 3) and a refrigerant line leading to the internal heat exchanger (the line at the bottom of the three-way valve). It is noted that a user would know the predetermined amount of refrigerant flow passing through the three-way valve based on the specifications of the refrigerant circuit of Aflekt. Also, the three-way valve would inherently aid in keeping the temperature of the refrigerant entering the expansion valve constant, since some of the refrigerant is allowed to bypass the expansion valve. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the refrigerant plant of Tanaka as modified by Menin to include the internal heat exchanger and three-way valve as taught by Aflekt in order to control the superheat of the compressor, thus ensuring efficient operation of the refrigerant plant.

Response to Arguments

3. Applicant's arguments filed 11/29/2010 have been fully considered but they are not persuasive.

On pages 3 & 4 of the Applicant's remarks, the applicant presents the following arguments pertaining to the rejection of claims 27-29, 31 and 32, more specifically, independent claim 27:

(a) The Applicant respectfully disagrees. In column 64, lines 10 forward of the Tanaka patent, it is explained that the opening of the motor-operated flow rate control valve 18 is set such that the amount of heat radiated in the heat amount adjusting heat exchanger 14 becomes equal to a certain other value. The respective valve 18 is not an injection valve or an expansion valve within the meaning of the present application, but is a control valve, which in a usual way controls the mass flow in the bypass line leading to the heat exchanger 14. On the other hand, the valve in Fig. 44 of the Tanaka patent, which is equivalent to the injection valve of the present application, is the expansion valve 13. However, the heat exchanger 12 is not directly positioned upstream of the entrance of this injection valve.

(b) Additionally, the Merlin patent shows in Fig. 1 (see diagram below), a refrigeration circuit with a compressor 1, a condenser 2, an expansion valve 7, and an evaporator 30. At the entrance of the expansion valve 7, a liquid separator-regenerative heat exchanger 3, is positioned. The thermal expansion valve 7 maintains a constant temperature superheating value of the refrigerant vapor after liquid separators 3 (column 6, lines 31-33). Therefore, a secondary medium is not involved unlike the subject invention as claimed.

(c) As a result, the Applicant believes that a combination of the teaching of both the Tanaka patent and the Menin patent do not teach the subject invention and furthermore, the Tanaka patent fails to show a heat exchanger directly at the entrance of the expansion valve, while the Menin patent discloses a liquid separator 3 operating without a secondary medium.

In response to argument (a), the Examiner respectfully disagrees. While the Examiner agrees that valve 18 of Tanaka is a motor operated control valve, the Examiner has interpreted that an injection valve is a valve that refrigerant is injected therein. In the refrigeration system of figure 44 of Tanaka, refrigerant would be injected into valve 18. Also, the claims doesn't recite limitations that would show that the claimed injection valve would function as an expansion valve. In addition, it is well known in the art that refrigeration systems include solenoid expansion valves that are controlled by a detected temperature at an outlet of an evaporator. Therefore, the Tanaka reference properly disclosed the claimed injection valve.

In response to argument (b), the Menin reference was not relied upon for the teaching on an injection valve. Rather, the Menin reference was relied upon for the teaching of maintaining the refrigerant upstream of an expansion valve constant.

In response to argument (c), the Applicant is advised to see the Examiner's response to the arguments set forth in sections (a) – (b). Therefore, the rejections of these claims are proper.

In conclusion, for at least the reasons stated above, the Examiner respectfully submits that the rejections of the pending claims are properly upheld.

Conclusion

4. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after

the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to AZIM RAHIM whose telephone number is (571) 270-1998. The examiner can normally be reached on Monday - Thursday 7am - 2pm EST and Friday 7am - 11am EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frantz Jules can be reached on 571-272-6681. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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9/21/2011

/Frantz F. Jules/

Supervisory Patent Examiner, Art Unit 3784